SERVIR

Regional Visualization and Monitoring System

SERVIR: A Brief Overview

Water Resources Challenges and Approaches

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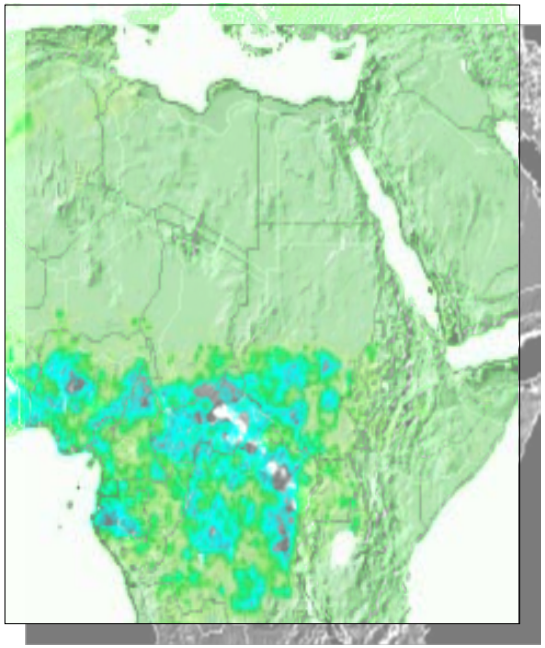
August 22, 2011

SERVIR

Enabling the use of earth observations and models for timely decision making to benefit society



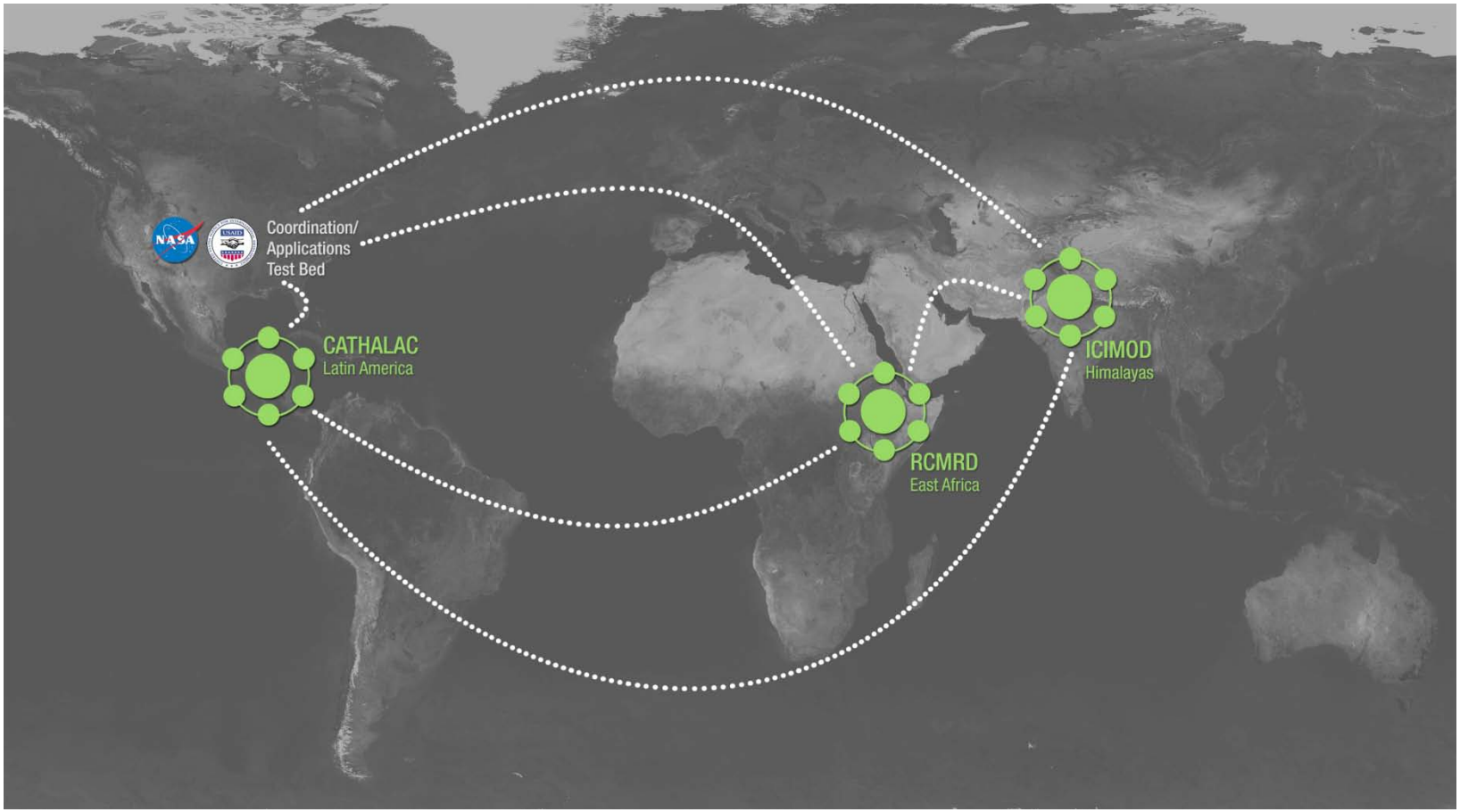
Flood Forecasting in Africa

Training and Capacity Building

Mapping Fires in Guatemala Mexico

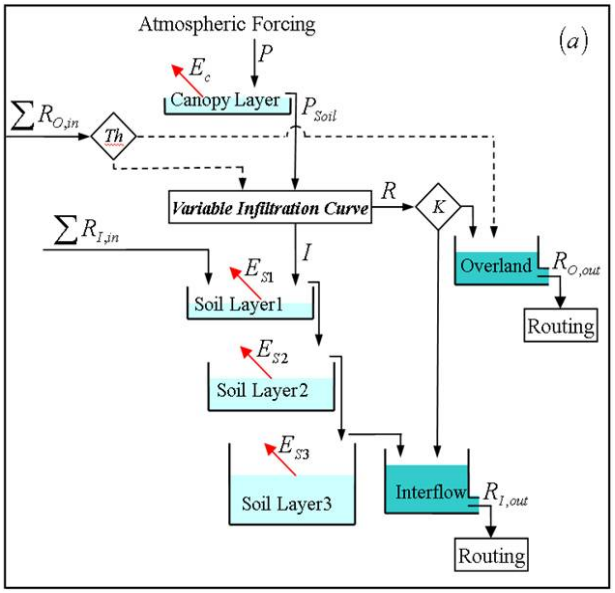
- **Data and Models**
- Online Maps
- **Visualizations**
- Decision Support
- **Training**
- Partnerships

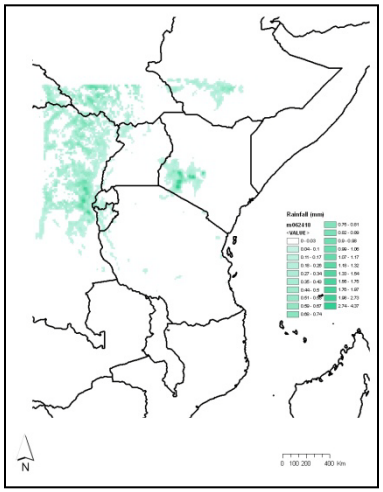
SERVIR Network



SERVIR Hydrologic Modeling in East Africa

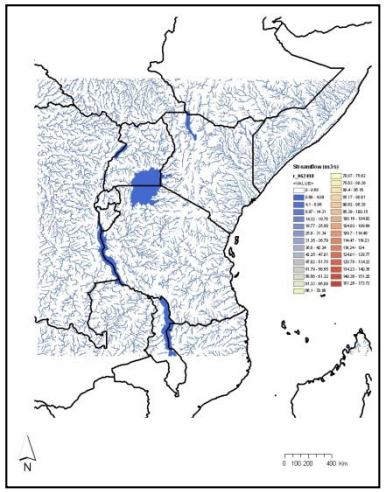
- Spatially distributed hydrologic model CREST (based on Variable Infiltration Capacity (VIC) model)
- Spatial resolution ~1km, run every 3 hours in near real time mode in the “Cloud”
- Uses near real-time satellite rainfall estimates from TRMM and forecasts from Kenya Meteorological Department (KMD) to produce soil moisture, evapotranspiration & streamflow
- Forecasted soil moisture, evapotranspiration and streamflow will enable KMD to issue early flood warning, especially in the flood prone watersheds in western Kenya.

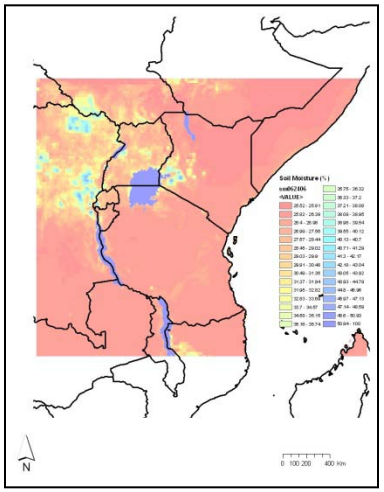




KMD QPF

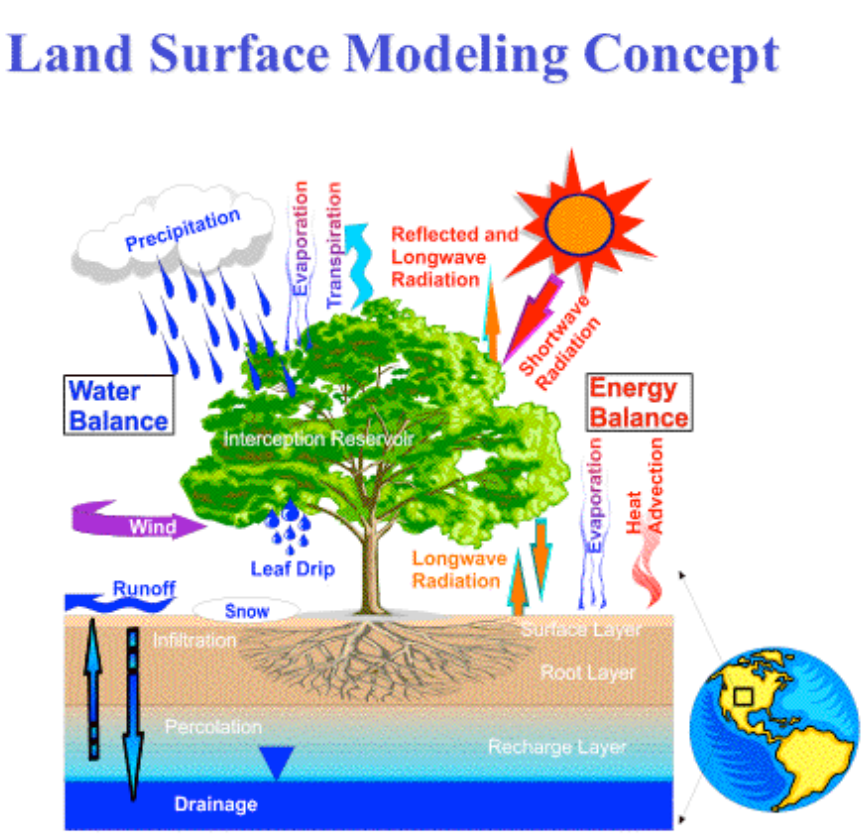
Streamflow





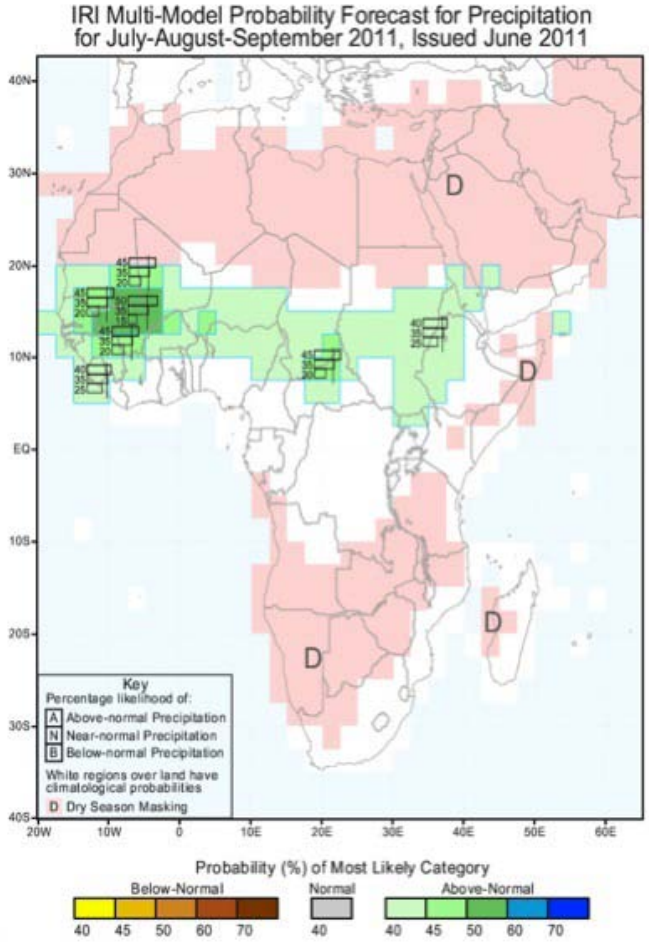
Soil Moisture

Baseline Datasets



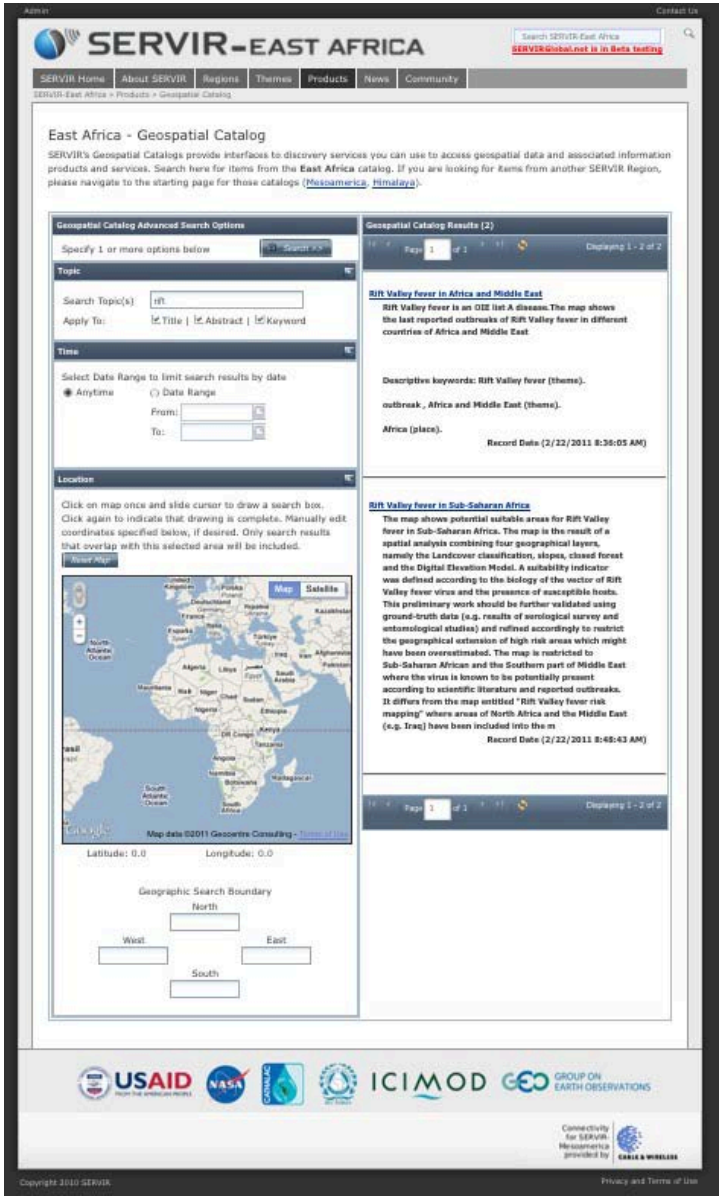
- Hydrologic observations do not exist in majority of the watersheds in the KMD domain.
- To generate modeled historic data, we have using a Global Reanalysis datasets (1949 – 2009), at refined scale using NASA Land Information System (LIS).
- These historic long-term data will provide the historic perspective to the near real time model estimates and to quantify hydrologic extremes including floods and drought.

Incorporating Seasonal Outlook

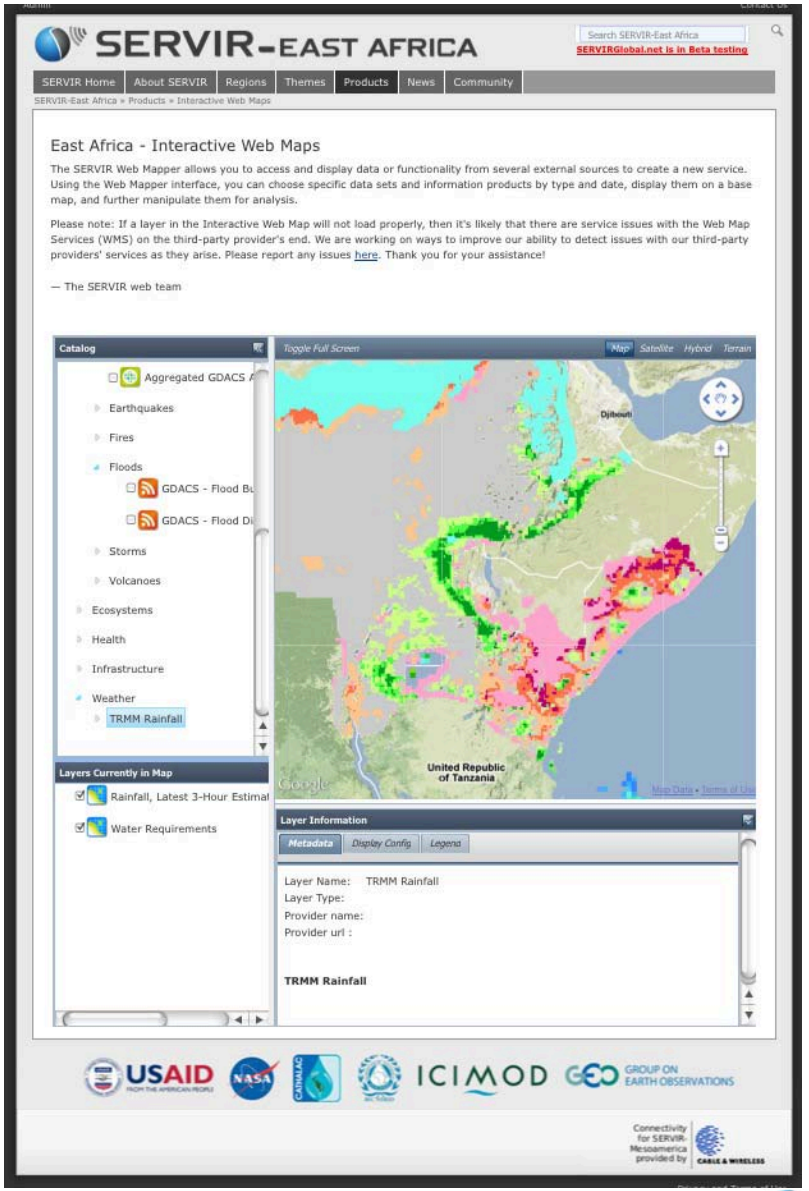


- Ensembles of seasonal forecasts need to be factored in the hydrologic predictions.
- Historic reanalysis allows us to assess the “normal”, “above” and “below” conditions.
- Expect to produce the hydrologic forecasts with the seasonal forecasts (target: end of the year).

SERVIR One-Stop Web Portal

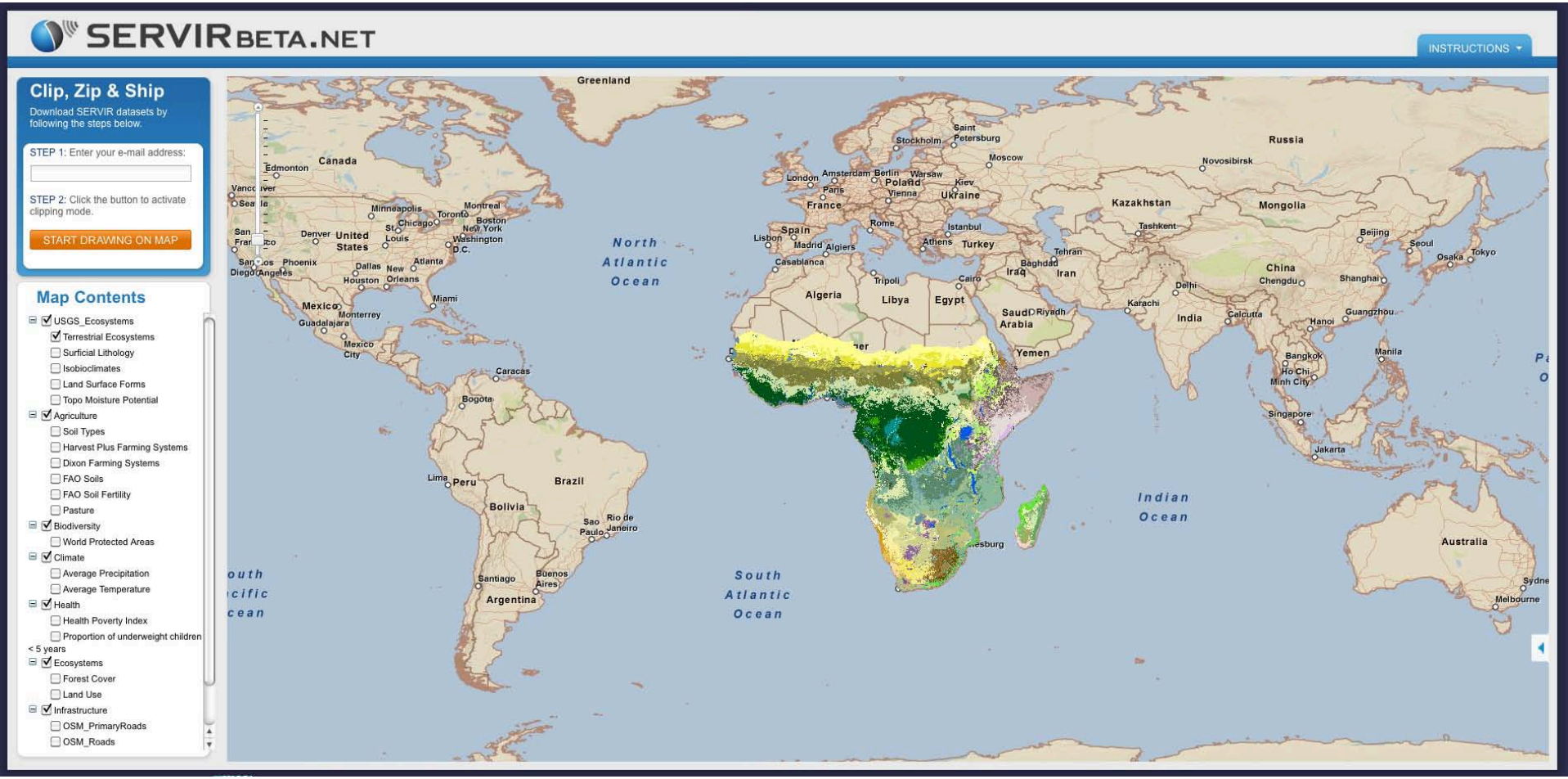


Geospatial Catalog



Interactive Web Maps

SERVIR Web Portal



In a Nutshell…

- SERVIR is a joint USAID – NASA effort, which uses remotely sensed data and products for societal benefit.
- SERVIR currently has three hubs, in Mesoamerica, East Africa and Himalaya.
- Collaborations are key. SERVIR is continuing to develop strong, working collaborations with government entities, such as KMD.
- Science Applications, IT infrastructure and capacity building is central to SERVIR efforts.

Thank you…

SERVIR Applications

SERVIR Applications have several dependencies:

- **NASA Applied Science Program**

  Agriculture, climate, disasters, biodiversity, public health & air quality, and water resources

- **GEO**

  Agriculture, biodiversity, climate, disaster, ecosystems, and human health

- **USAID**

  Climate change adaptation, Terrestrial carbon assessment and GEO focus areas

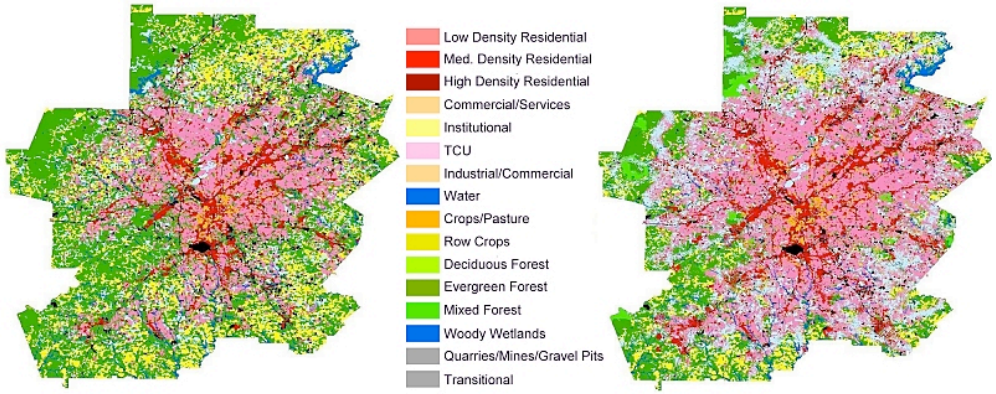
- **Regional Needs Assessment**

  All SERVIR science Applications are supported by identified needs

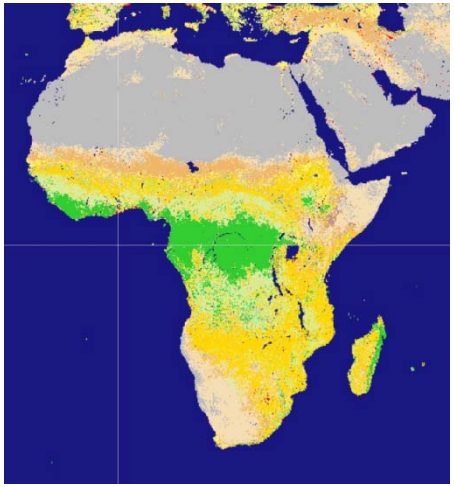
Land Cover and Land Cover Change

- SERVIR-East Africa is participating in a USEPA project to quantify land use change and greenhouse gas inventory in east Africa. USFS has initiated planning for Himalayan region.

- In the long term, SERVIR-East Africa would like to link land use land cover change to hydrologic assessments. These inventories, and future land cover scenarios will bring improvements in the hydrologic assessments and will also enable the end users in the region with quantitative information to better prepare for adaptation.



Land Cover and Land Cover Change



- SERVIR is putting together a plan to develop three temporal slices of land cover maps over a region in east Africa using medium resolution (30m Landsat multi-spectral imagery)

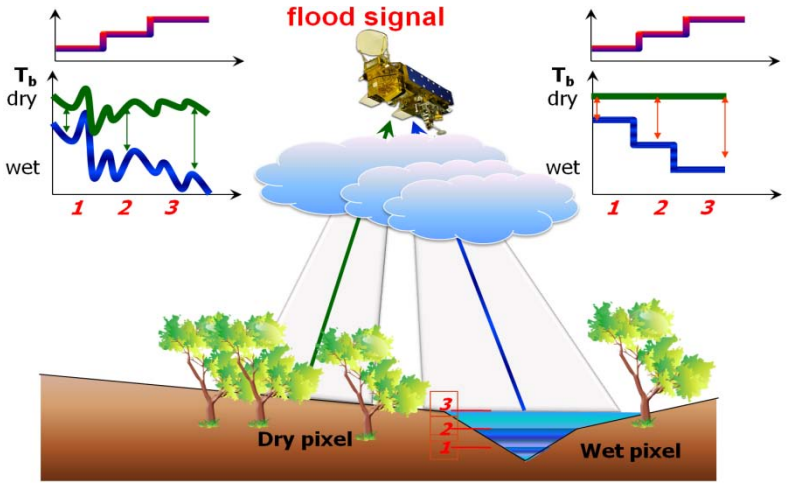
- Plan includes training ground sampling crew for collection of validation data and training the in-country technicians in land cover classification and assimilation of validation data

- SERVIR will perform quality assessment and accuracy assessment quantification

- This assessment will also enable linking and quantifying changes to the hydrologic regime

Assimilating Remotely Sensed Streamflow in Modeled Estimates

- Later this year, we plan to assimilate microwave-based streamflow estimates (TRMM and AMSR-E) into the CREST model.
- Spatial resolution of the microwave products will be coarser, but will provide a temporal signal of statistical significance, which will result in improved initializations for the forecast runs.
- Additional data and methods for assimilation are valuable, and will provide improved forecasts.



Flood Potential

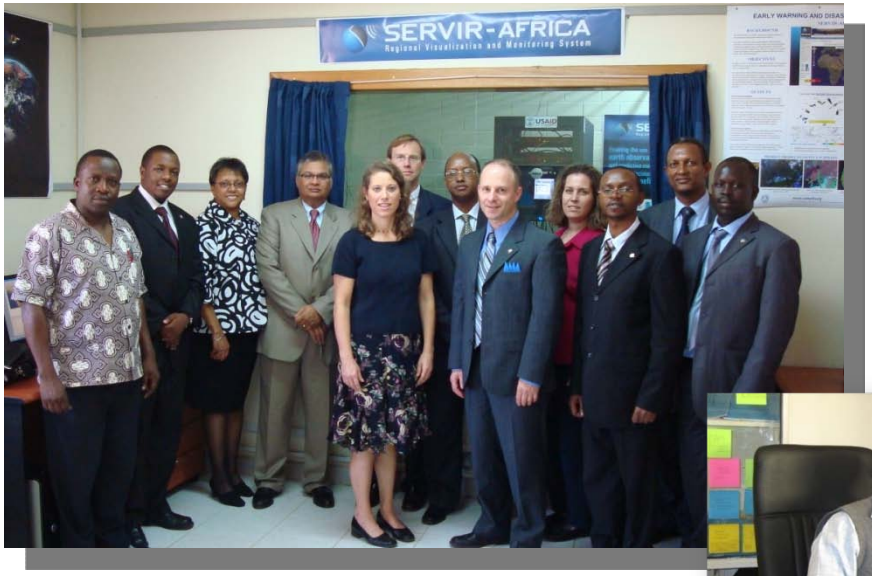
SERVIR @ CATHALAC

City of Knowledge, Panama

Inaugurated on February 3, 2005

SERVIR-Africa @ RCMRD

Nairobi, Kenya



Inaugurated on
November 21, 2008

Erick
Project Lead
at
RCMRD

Tesfaye
Senior Scientist

Lawrence
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Database
Manager

Catherine
Remote
Sensing
Analyst

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Specialist

SERVIR-Himalaya @ ICIMOD

Kathmandu, Nepal

Inaugurated on
October 5, 2010